BUREAU OF WATER

South Carolina Department of Health and Environmental Control

Source Water Assessment

A Technical Report for Public Water Systems

Water System: **School House Restuarant**
2170253
Florence County

Water Source: Groundwater:
G21353

April 24, 2003

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South Carolina Department of Health and Environmental Control

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SUMMARY

This report contains the completed groundwater susceptibility assessment for the School House Restuarant, System No. 2170253. The system includes public supply wells:G21353. The system is located in Florence, South Carolina and serves a primary population of 26. The system is located in Vulnerability Area 3 in the Coastal Plain physiographic province. The source aquifer is confined. Of the 1 potential contaminant sources (PCSs) in this initial inventory, 1 PCSs had more than one category of contaminants. The inventory includes no PCSs with volatile organic compounds (VOCs), no PCSs with petroleum products, no PCSs with metals, 1 PCSs with nitrates, 1 PCSs with pesticides/herbicids, 1 PCSs with pathogens, no PCSs with radionuclides, and no PCSs with undetermined contaminants. The susceptibility analysis determined no PCSs with a high susceptibility ranking, 1 PCSs with a moderate susceptibility ranking, and no PCSs with low susceptibility ranking.

INTRODUCTION

The 1996 Amendments to the Safe Drinking Water Act required the States to develop Source Water Assessment and Protection Programs (U.S. Environmental Protection Agency, 1996). The program's goal is to provide added protection of both groundwater and surface water drinking water sources by conducting source water assessments and implementing protection measures. To meet this goal, SCDHEC is serving as the coordinating agency for the State's Source Water Assessment and Protection Program (SWAP) and has conducted assessments of the source water for all federally defined drinking water supply systems. A more detailed description of the program can be found in a Bureau of Water publication, *A Guide to Source Water Protection* (September 2002).

This report contains the completed assessment for the School House Restuarant, System No. 2170253 that includes drinking water well(s): G21353. Site-specific information for each susceptibility assessment was obtained from SCDHEC files, site inspections, and published reports on hydrogeology (Colquhoun and others, 1983) and aquifer tests (Aucott and Newcome, 1986; Newcome, 1993). A copy of this assessment report can be obtained by contacting the Bureau of Water in Columbia, South Carolina at (803) 898-4300 or on the web at http://www.scdhec.net/water.

WATER INTAKE INTEGRITY AND VULNERABILITY

Sanitary surveys of public water supply systems are conducted periodically by the Department. Part of that inspection includes the evaluation of the physical integrity of the intake structure and identification of any potential threats to the intake. To get more information about the latest sanitary survey for System No. 2170253, call the Drinking & Recreational Waters Compliance Section of the SCDHEC in Columbia, South Carolina at (803) 898-3543.

The SCDHEC evaluated the relative vulnerability of aquifers on the basis of geographic/physiographic location within the state. The State's hydrogeology is divided into three geographic areas of relative vulnerability (Figure 1.) Aquifers in Area 1 are generally unconfined and are considered vulnerable to activities at land surface. Aquifers in Area 2 generally are semi-confined and are considered less vulnerable relative to aquifers in Area 1. Aquifers in Area 3 generally are confined and are considered the least vulnerable, relative to Areas 1 and 2.

DESCRIPTION OF SYSTEM AND SOURCE

The School House Restuarant, System No. 2170253 is located in Florence County, South Carolina. The system serves a primary population of 26. The drinking water sources for the system is/are 1 drinking water supply well(s): G21353 (Table 1).

System No. 2170253 is located in Vulnerability Area 3 in the Coastal Plain physiographic province. The source aquifer is confined.

DELINEATION OF SOURCE WATER PROTECTION AREAS

Source Water Protection Areas (SWPA's) or Wellhead Protection Areas (WHPA's) were delineated for the 1 water supply well(s) in System No. 2170253. For wells in the Piedmont or rock wells, a volumetric equation incorporating pumping rate and recharge rate was used to calculate an area of contribution. The area of contribution is equal to the SWPA for the well. For wells in the Coastal Plain, RESSQC – a U. S. Environmental Protection Agency computer code - was used to estimate time of travel (TOT) in the source aquifer and to delineate TOT zones around each well. (U. S. Environmental Protection Agency, 1993). The outer edge of the 10-year TOT zone delineates the SWPA for each well. Site-specific well construction and aquifer hydraulic properties used to calculate the 1-, 5-, and 10-year time of travel zones surrounding each well area summarized in Table 1.

POTENTIAL CONTAMINANTS OF INTEREST AND THE INVENTORY OF POTENTIAL CONTAMINANT SOURCES

Eight categories of potential contaminants of interest were considered by the SCDHEC for susceptibility analysis. These eight categories include: volatile organic compounds (VOCs), petroleum products, metals, nitrates, pesticides/herbicides, pathogens, radionuclides, and undetermined.

Potential contaminant sources (PCSs) are defined by land-use or site-specific activities that could potentially release contaminants of interest within the SWPA. Examples of PCSs include gas stations, dry cleaners, agricultural areas, automobile repair shops, landfills, septic systems, and manufacturers, businesses, and facilities where potential contaminants of interest are used or stored.

The SCDHEC identified an initial inventory of the potential contaminants of interest at 1 PCSs in the SWPAs for System No. 2170253 (Appendix A). The inventory and location of each PCS was obtained from the SCDHEC databases and site inspections. The inventory was added to a GIS database and plotted relative to the SWPA around each well (Figure 2.).

SUSCEPTIBILITY ANALYSIS

A susceptibility matrix is used to rank the susceptibility of source water to a potential contaminant source within a SWPA (Table 2.). The matrix assigns a ranking of high, moderate or low susceptibility to each PCS on the basis of location of the public supply system (Vulnerability Area 1, 2, or 3, Figure 1.) and the contaminant of interest.

Of the 1 PCSs identified in the initial inventory, 1 PCSs had more than one category of contaminant. System No. 2170253 had no PCSs with VOCs, no PCSs with metals, 1 PCSs with pesticides/herbicides, 1 PCSs with pathogens, no PCSs with radionuclides, no PCSs with undetermined, no PCSs with petroleum products, and 1 PCSs with nitrates (Appendix A). System No. 2170253 had no PCSs with a high susceptibility ranking, 1 PCSs with a moderate susceptibility ranking, and no PCSs with a low susceptibility ranking (Appendix B).

LOCAL PROTECTION PLANS

The information provided in this report is intended to be the foundation of a local effort to provide better protection of our state's sources of drinking water. The initial inventory of PCSs and potential contaminants of interest presented in this report should be verified by the owners and managers of

System No. 2170253 for accuracy and annually updated to reflect changes in land-use and site-specific activities within the SWPA.

SELECTED REFERENCES

- Aucott, W.R., and Newcome, Roy, 1986, Selected aquifer-test information for the Coastal Plain aquifers of South Carolina: U.S. Geological Survey Water-Resources Investigations Report 86-4159.
- Colquhoun, D. J., Woollen, I. D., Van Nieuwenhuise, D. S., Padgett, G. G., Oldham, R. W., Boylan, D. C., Bishop, J. W., and Howell, P. D., 1983, Surface and Subsurface Stratigraphy, Structure and Aquifers of the South Carolina Coastal Plain.
- Newcome, R., Jr., 1993, Pumping Tests of the Coastal Plain Aquifers in South Carolina, With a Discussion of Aquifer and Well Characteristics: State of South Carolina Water Resources Commission Report 174.
- U. S. Environmental Protection Agency, 1993, RESSQC-WHPA Version 2.2.

Table 1. Parameters Used to Calculate Time-of-Travel Zones for Each Well and Delineate the Source Water Protection Area.

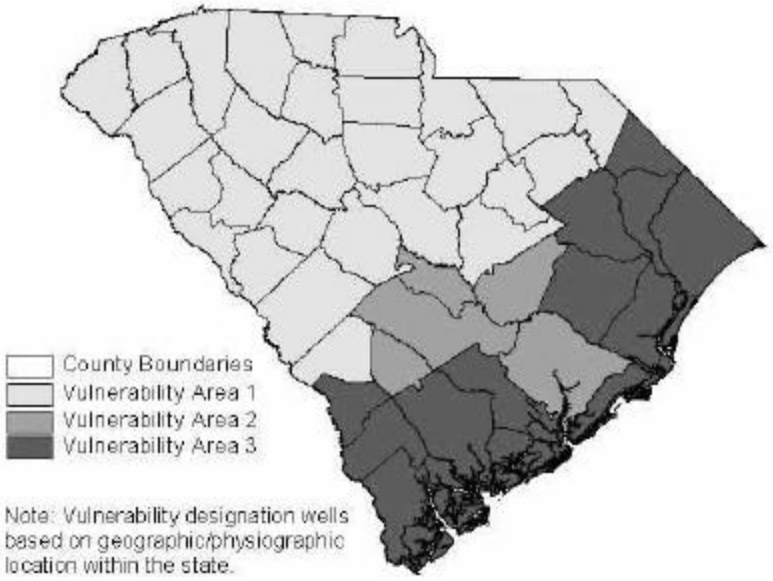
Table 2. Groundwater Susceptibility Matrix

Table 2 Groundwater Susceptibility Matrix			
Type of Contaminant	**Vulnerability Area 1**	**Vulnerability Area 2**	**Vulnerability Area 3**
Volatile Organic Compounds (VOCs)	HS	MS	MS
Petroleum Products	HS	LS	LS
Metals	HS	LS	LS
Nitrates	HS	MS	LS
Pesticides/Herbicides	HS	LS	LS
Pathogens	HS	LS	LS
Radionuclides	HS	MS	LS
Undetermined	HS	MS	MS

HS = High Susceptibility
MS = Moderate Susceptibility
LS = Low Susceptibility

Figure 1. Vulnerability Designations for the State.

Vulnerability Area Designations for the State



Note: Vulnerability designation wells based on geographic/physiographic location within the state.

Figure 2. Source Water Protection Area(s) and Locations of Potential Contaminant Sources (PCSs) for School House Restuarant.

APPENDIX A

Inventory of Potential Contaminants of Interest for each Potential Contaminant Source for School House Restuarant.

APPENDIX B
Potential Contaminant Source Susceptibility Analysis for School House Restuarant.